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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/887,697	11/01/2001	Shih-Fu Lee	146712013800	3474
50268 7590 01/25/2007 SEAGATE TECHNOLOGY c/o MOFO NOVA 1650 TYSONS BOULEVARD SUITE 300 MCLEAN, VA 22102			EXAMINER PROCTOR, JASON SCOTT	
			ART UNIT 2123	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		01/25/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

09/887,697

Applicant(s)

LEE ET AL.

Examiner

Jason Proctor

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 5,7,8 and 11-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 5,7,8 and 11-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 January 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claims 5-16 were rejected in the Office Action of 18 July 2006.

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 20 November 2006 has been entered.

Applicants' submission of 20 November 2006 has amended claims 5, 7, 8, 11; and 13; and canceled claims 6, 9, 10, and 16. Claims 5-8 and 11-15 are pending in this application.

Claims 5, 7-8 and 11-15 are rejected.

Claim Objections

The previous objections to the claims that are not reiterated below have been withdrawn in response to Applicants' amendments thereto.

1. Claims 5, 7, 8, 11, and 13 are objected to because of the following informalities:

The phrase "a substrate or of" in claim 5, lines 2 and 6; claim 7, line 3; claim 11, line 3; and claim 13, line 3 appears to contain a grammatical error.

The phrase "an air bearing code the head" in claim 8, line 7 appears to contain a grammatical error.

Appropriate correction is required.

Claim Interpretation

The Examiner thanks Applicants for the clarifying remarks in the 20 November 2006 submission.

For the reasons set forth in the previous Office Action, where claims 11 and 13 require the inclusion of “a model for glide avalanche” that has no relation to the method of claim 5, this requirement is interpreted as equivalent to the method of claim 5. Therefore a reference that anticipates or renders obvious the method of claim 5 will similarly anticipate or render obvious the method of claims 11 and 13.

This interpretation was explicitly set forth in the previous Office Action. Applicants have not directly refuted this interpretation in the 20 November 2006 submission.

Claim Rejections – 35 USC § 101

The previous rejections of the claims that are not reiterated below have been withdrawn in response to Applicants’ amendments thereto.

35 U.S.C. § 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claims 5, 7-8 and 11-15 are rejected under 35 U.S.C. § 101 because the claimed invention is directed to non-statutory subject matter.

Independent claim 5 recites an abstract mathematical algorithm that is not limited to statutory subject matter. The claim defines an abstract idea that fails to transform an article or physical object to a different state or thing; and fails to otherwise produce a useful, concrete, and tangible result.

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MPEP 2106(IV)(C)(2) states:

A claimed invention is directed to a practical application of a 35 U.S.C. 101 judicial exception when it:

(A) “transforms” an article or physical object to a different state or thing; or

(B) otherwise produces a useful, concrete and tangible result, based on the factors discussed below.

The language of claim 5 does not appear to make any attempt to claim “transforming” an article or physical object to a different state or thing.

The language of claim 5 is directed to “determining a head-media spacing,” which is interpreted as determining a value representative of a head-media spacing. The claimed steps comprise “generating a function,” “measuring topography [...] of the actual disc media surface,” “performing a Fourier transform (a mathematical operation),” “multiplying [...] to obtain a product,” and “integrating the product (a mathematical operation).” Claim 5 therefore recites a single step of gathering necessary measurement data (“measuring topography”), but otherwise recites a method composed entirely of mathematical operations. The **result** of this method is a **mathematical result**, i.e. a number.

The claim language is not limited to any practical application of the abstract mathematical result of the method. The “integrated product” is not employed to control a head, is not stored in a computer readable storage media for later retrieval, and is not tangibly displayed for review, to list several examples. The claimed method merely **calculates a mathematical result**.

Therefore, the claimed method is directed toward gathering the necessary input values by measurement, then performing a purely mathematical algorithm to produce a number. A calculated number cannot be interpreted as a tangible result of a method. This claimed method is non-statutory for claiming an abstract mathematical algorithm that fails to transform an article or

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physical object to a different state or thing and fails to produce a useful, concrete, and tangible result.

In response to the previous rejection, Applicants argue primarily that:

MPEP 2106, citing *Diamond v. Diehr*, states that “if a process claim includes one or more post-computer process steps that result in a physical transformation outside the computer (beyond merely conveying the direct result of the computer operation), the claim is clearly statutory. In claim 5, the step of “measuring topography as a function of a distance in down track direction of the substrate or of the disc media surface requires physical acts to be performed outside the computer such as “sampling topography” (see claim 7) by a physical instrument such a topography profiler. This step of “measuring topography as a function of distance in down track direction of the substrate or of the disc media surface” is independent of the steps to be performed by a programmed computer, where the step involves manipulation of tangible physical objects, e.g., the substrate or the disc media surface.

The Examiner respectfully traverses this argument as follows.

Applicants have not identified any “post-computer process steps that result in a physical transformation outside the computer” in claim 5. Applicants have instead referred to a pre-computation step of “measuring topography”. The Examiner fails to understand the basis upon which Applicants conclude the claim is statutory.

Applicants’ arguments have been fully considered but have been found unpersuasive.

To expedite a complete examination of the instant application the claims rejected under 35 U.S.C. § 101 (nonstatutory) above are further rejected as set forth below in anticipation of applicant amending these claims to place them within the four statutory categories of invention.

Claim Rejections - 35 USC § 112

The previous rejections of claims 5-15 under 35 U.S.C. § 112, first paragraph, are withdrawn in response to Applicants’ remarks and amendments thereto.

The Examiner thanks Applicants for the clarifying remarks.

The previous rejections of claims 5-15 under 35 U.S.C. § 112, second paragraph, are withdrawn in response to Applicants' remarks and amendments thereto.

Response to Arguments – 35 USC § 102

In response to the previous rejections of claims 5-16 and 18-20 under 35 U.S.C. § 102(a) as being anticipated by "The dynamic coupling of the slider to the disk surface and its relevance to take-off height" by Gonzalez et al., Applicants argue primarily that:

Applicants respectfully submit that the Examiner has not presented any evidence that what he is relying in Gonzalez was available to the public at the IEEE meeting of January 2001 or prior to March 16, 2001. The evidence stated on page 19 of the Action does not prove that the Gonzalez reference was available in January 2001.

The Examiner respectfully traverses this argument as follows.

The "Intermag 2000 –Call for Papers" Internet site states "Papers must be presented at the Conference by an author registered at the Conference in order to be published in the Proceedings." It is noted that the Gonzalez paper has been published in the proceedings. These documents have been made of record previously.

Applicants further argue that:

In fact, as explained by the Examiner, the call for papers for Intermag 2000 states that all manuscripts must be received by October 13, 2000. The undersigned himself used to be a scientist at one time and he is fully aware that is quite common practice among scientists to submit a manuscript in response to the call for papers and later not show up at all to present the paper at the conference or to present only a portion of the paper at the conference because of the short time period allocated to each presenter at the conference to present the paper. In light of such common practices among scientists, Applicants are again requesting the Examiner to provide evidence that the Gonzalez reference was in fact presented at the conference in January 2001 in its entirety or least to the extent relied upon by the Examiner in making the rejection. So far, the Examiner has failed to provide this evidence. Therefore, the USPTO has failed to establish a *prima facie* case of anticipation.

The Examiner respectfully traverses this argument as follows.

The Examiner does not understand the relevance of Applicants' speculation that it is *possible* that Gonzalez submitted a manuscript, but *potentially* failed to show up at all or *potentially* presented only a portion of the paper. Based upon the factual evidence presented by Applicants, it appears equally likely that Gonzalez presented the entire paper. It is noted that Applicants have cited no factual support for any of this argument.

The Examiner's conclusion that the Gonzalez reference was available at the January 7-11, 2001 meeting date is based entirely upon the factual statements found in the documents related to that meeting. These factual statements have been explicitly set forth in the previous Office Action. For Applicants' convenience, they are the following.

The citation page attached to the Gonzalez reference states "Meeting Date: 01/07/01 – 01/11/01"

The first page of Gonzalez states "Manuscript received October 12, 2000"

The table of contents from "IEEE Transactions on Magnetics," July 2001, Volume 37, Number 4, Part 1, describes the contents as "Selected Papers from the Eighth Joint Magnetism and Magnetic Materials – International Magnetics Conference (MMM-INTERMAG) Mariott Rivercenter Hotel, San Antonio, Texas, January 7-11, 2001." The Gonzalez reference is listed on page 8 of that document.

The "Intermag 2000 –Call for Papers" Internet site states "The maximum paper length is six journal pages for invited papers and three journal pages for contributed papers. All manuscripts must be received by October 13, 2000," and "Papers must be presented at the Conference by an author registered at the Conference in order to be published in the Proceedings." It is noted that the Gonzalez paper has been published in the proceedings.

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Applicants also argue that (emphasis in original):

The table of contents from the "IEEE Transactions on Magnetics," July 2001, states "Selected Papers from the Eighth Joint Magnetism and Magnetic Materials – International Magnetics Conference (MMM-INTERMAG) ... January 7-11, 2001" and lists the Gonzalez reference on page 8. Thus, the Examiner is *assuming* that the Gonzalez reference *must* have been presented *in its entirety* at the conference in January 2001. Applicants respectfully submit that this assumption is still not proven by *evidence*.

The Examiner respectfully traverses this argument as follows.

The Examiner's conclusion that the Gonzalez reference was available at the January 7-11, 2001 meeting date is based entirely upon the factual statements found in the documents related to that meeting. These factual statements have been explicitly set forth in the previous Office Action and immediately above.

Applicants' arguments have been fully considered but have been found unpersuasive.

Response to Arguments – 35 USC § 103

Applicants submit that the previous rejection of claim 16 under 35 U.S.C. § 103 is moot because claim 16 has been canceled. Accordingly, the previous rejection under 35 U.S.C. § 103 is withdrawn.

Claim Rejections – 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

3. Claims 5, 7-8 and 11-15 are rejected under 35 U.S.C. § 102(a) as being anticipated by “The dynamic coupling of the slider to the disk surface and its relevance to take-off height” by Gonzalez et al., hereafter referred to as Gonzalez.

Regarding claim 5, Gonzalez discloses a method of determining a head-media spacing between a head and a disc media surface [*“we calculate the frequency response of glide sliders to disk inputs of various wavelengths, using an air-bearing solver.”* (abstract); *“From the simulation, the ratio of clearance modulation amplitude to the disk waviness amplitude is shown in Fig. 4...”* (page 2, right column)] comprising:

Generating an air bearing transfer function as a function of wavelength [*“The dynamic modeling of the low flying 62% slider used in this experiment was done using the CML dynamic air-bearing code [7]... The clearance modulation ratio shows that for short wavelengths, the slider does not comply to the disk, giving a wavelength range that could be called “roughness.” For longer wavelengths, we have partial compliance and this could be used to define a wavelength range called disk “waviness.””* (page 2, right column, first paragraph)];

Measuring topography as a function of distance in down track direction of the disc media surface [*“Disk substrates (13 cells) with various polishing conditions were sputtered and used for this experiment. Measurements of disk roughness were made using a Tencor (EX) stylus profilometer.”* (page 2, left column, first paragraph); *“The asperity mapping method divides the disk into 1000 angular sections ($\sim 200\mu\text{m}$ at 30 mm radius) which are $100\mu\text{m}$ wide in the radial direction and detects repeatable asperity contacts.”* (page 1, right column, second paragraph)];

Performing a Fourier transform of the topography as a function of the distance to obtain a squared topography function as a function of wavelength [*“The FFT of the disk roughness*

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profiles from the 13 cells was filtered using the response curve with the least "compliance," the FH minimum for the low flying 62% slider in Fig. 4, and transformed back to obtain the filtered "effective" disk roughness." (page 2, right column, second paragraph); FIG. 4 depicts topography as a function of wavelength (independent axis)];

Multiplying the squared topography function as a function of wavelength and the air bearing transfer function as a function of wavelength to obtain a product; and integrating the product over a range of wavelengths to obtain the head media spacing [*"From this effective roughness the peak mean statistic, for a 200 μ m sampling length was used in the multi-flying height asperity mapping, was computed. The TOH is plotted against the results of the analysis in Fig. 5."* (page 2, right column, second paragraph); *"This analysis is extendable to different slider sizes and air bearing designs (Fig. 4) and indicates the spatial frequency components in disk roughness that contribute most significantly to the TOH or glide avalanche."* (page 3, right column)].

Regarding claim 7, Gonzalez discloses sampling topography as a function of distance of the actual disc media surface [*"Measurements of the disk roughness were made using a Tencor (EX) stylus profilometer."* (page 2, left column)].

Regarding claim 8, Gonzalez discloses that generating an air bearing transfer function as a function of wavelength comprises determining an air bearing transfer function from an air bearing code for the head [*"The dynamic modeling of the low flying 62% slider used in this experiment was done using the CML dynamic air-bearing code [7]... The clearance modulation*

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ratio shows that for short wavelengths, the slider does not comply to the disk, giving a wavelength range that could be called "roughness." For longer wavelengths, we have partial compliance and this could be used to define a wavelength range called disk "waviness."" (page 2, right column, first paragraph)].

Regarding claims 11-15, these claims recite limitations that have no positively recited relation to the method of claim 5 from which they depend. Therefore claims 11-15 are interpreted as functionally equivalent to the method of claim 5. As Gonzalez anticipates claim 5, Gonzalez similarly anticipates claims 11-15.

Conclusion

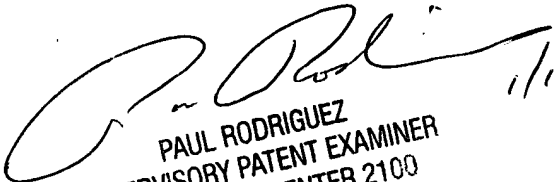
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Proctor whose telephone number is (571) 272-3713. The examiner can normally be reached on 8:30 am-4:30 pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez can be reached at (571) 272-3753. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 Group receptionist: 571-272-2100. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jason Proctor
Examiner
Art Unit 2123

jsp

 11/19/07
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